The epidemic of chronic kidney disease in Central America

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Immediate and coordinated action is needed to address the epidemic of chronic kidney disease sweeping across Central America. The disorder, known as CKDnT, is not related to traditional causes such as hypertension and diabetes, and mainly affects young male agricultural workers, the highest mortality being in El Salvador[1] and Nicaragua (figure).[2,3] However, CKDnT also affects women and non-agricultural workers living in farming communities. Mortality estimates from the Pan American Health Organization (PAHO) show that chronic kidney disease coded as N18 in WHO's International Classification of Diseases revision 10—a proxy for CKDnT—in men younger than 60 years has been responsible for thousands of deaths in the past decade in Central America.

CKDnT is characterised by a tubulointerstitial nephropathy with low-grade proteinuria, which has a long subclinical period that tends to progress to end-stage renal disease in a short period of time.[4] The scarcity of coverage and access to health services might contribute to the clinical course and high mortality rates of CKDnT. Health authorities, for example in El Salvador, responded to this poor coverage by increasing access to health services; however, the large number of patients and absence of adequate infrastructure and trained personnel led to overloaded hospitals. Similar epidemiological and clinical patterns of CKDnT have been reported in other countries, such as Sri Lanka.[5]

Causes of the CKDnT epidemic are not clear, although a consensus exists among researchers on its multifactorial character and relation to social, environmental, and economic determinants. Most commonly postulated causes include exposure to pesticides,[3,5] heat stress with recurrent dehydration,[6] and an excessive intake of high-sugar drinks.[7] Exposure to heavy metals, use of non-steroidal anti-inflammatory drugs and alcohol, and infectious diseases have similarly been postulated as causes for the CKDnT epidemic.[4] Research to identify determinants of the epidemic is necessary, but the moral duty to address an epidemic cannot be postponed until its causes are identified. A coordinated response from the public health sector and other related sectors is urgently needed.

In addition to health services required to treat affected people, public health bodies need to consider environmental and occupational health measures. The two main hypotheses for the high incidence and excess mortality—ie, the use of pesticides and heat stress along with dehydration—are strongly related to the absence of a regulatory system to control agrochemical use and the poor compliance with rules and standards to protect the labour force's health.

Almost all Central American countries are signatories to the Stockholm Convention on Persistent Organic Pollutants[8] and the Rotterdam Convention on Prior Informed Consent. Compliance, however, is far from

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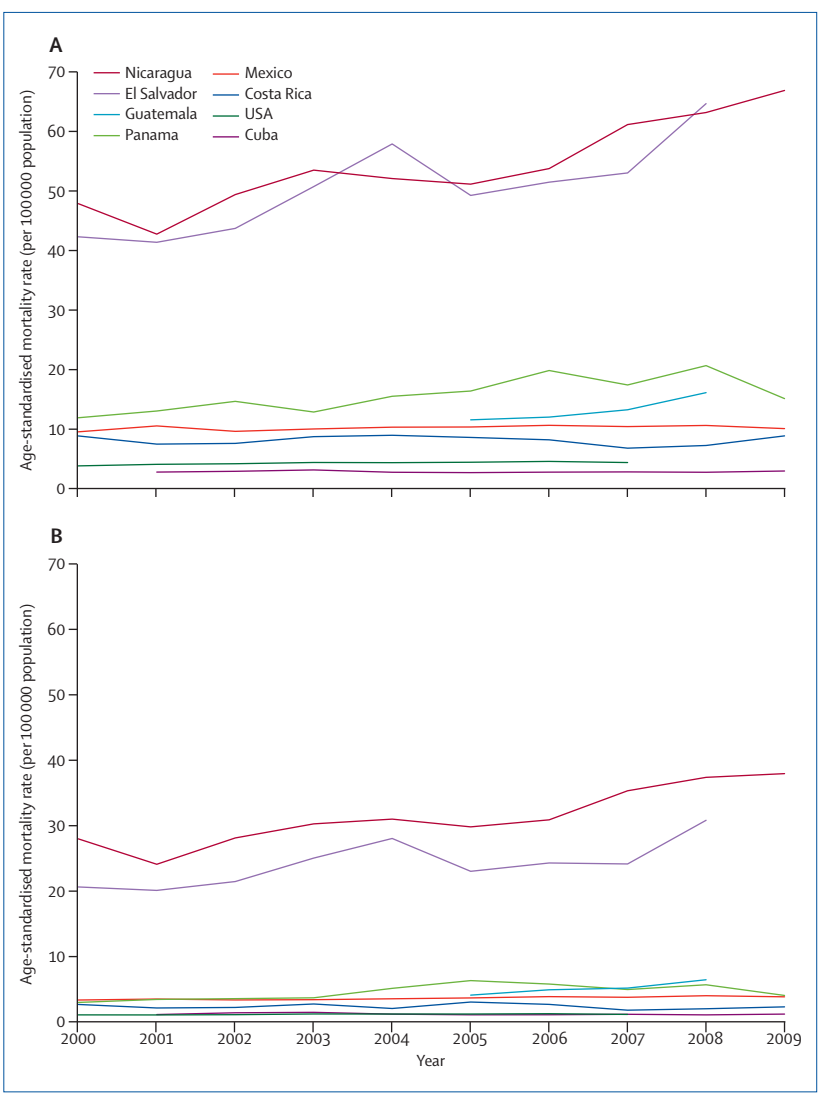

***Figure*: Chronic kidney disease (ICD-10 codes N18) age-standardised mortality rate in men in 2000–09, for selected countries in the Americas**
(A) All ages. (B) Aged 0–60 years. No data were available for El Salvador for 2009, Guatemala for 2000–04 and 2009, USA for 2008–09, and Cuba for 2000. Data sources are the regional mortality database for the Americas from Pan American Health Organization (PAHO) and WHO. ICD10= WHO's International Classification of Diseases revision 10.

effective. The Central American Institute for Studies on Toxic Substances reported that, between 2000 and 2004, Central America imported 33 million kg of active ingredients per year, including high volumes of hazardous pesticides, most of which are tightly regulated by international treaties.[9] Central American populations are thus at high risk of the acute and chronic toxic effects of pesticides irrespective of the causes of the CKDnT epidemic. Compliance with relevant international treaties, existing laws, and regulations needs to be secured immediately to protect the health and rights of workers. Present compliance with regulations on workplace health is very poor, as shown in a 2013 report[10] that extensively documents the deficient working conditions in western Nicaragua, one of the most affected communities, and proposes interventions to mitigate the situation.

In 2013, in response to a request from the Minister of Health of El Salvador to the PAHO Directing Council, Member States recognised the CKDnT epidemic in Central America as a serious public health problem and approved a resolution for ethically imperative urgent action, even if the causes of CKDnT have not been established.[3] Awareness of the epidemic among policy makers and the general public is critical to advance global health actions in response to CKDnT.

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We declare no competing interests.

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